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Definitions

Airport Noise Zone (ANZ): An area of land surrounding the airport within which noise levels are equal to or greater than DNL 65 dBA.

Code of Maryland Regulations (COMAR): Requires MDOT MAA to control development in areas where noise levels are DNL 65 dBA or more.

Decibel (dBA): An exponential unit of measurement of sound pressure adjusted for the human ear's response to particular frequencies.

Day-Night Average Sound Level (DNL or Ldn): A descriptor of 24-hour noise that assigns a nighttime penalty.

Sound Exposure Level (SEL): A term used to describe noise from a single event. It takes into account both the maximum level (Lmax) and duration of the event.

This report was prepared by the Maryland Department of Transportation Maryland Aviation Administration, Office of Real Estate and Noise Abatement. For further information, please call 410.859.7375.



Summary

This report provides a review of the aviation noise abatement program for the third quarter of 2017 (July 1 to September 30). Included in this report is information on jet aircraft operations, observance rates for noise abatement procedures, complaints received about aircraft noise, and community outreach efforts by the Maryland Department of Transportation Maryland Aviation Administration (MDOT MAA).

- Average daily jet flights were approximately 677 per day during the 3rd Quarter of 2017, compared to 646 per day for the 3rd Quarter of 2016.
- Night-time jet operations averaged 112 per night for the 3rd Quarter of 2017, compared to 98 per night in the 3rd Quarter of 2016.
- A total of 5,685 calls and e-mail complaints were made to the Noise Office during the 3rd Quarter of 2017 compared to approximately 830 calls and e-mails during the 3rd Quarter of 2016.
- The Airport operated in west flow operations for 67 percent of the time during the 3rd Quarter of 2017.

Aviation News Items of Interest

- Governor Larry Hogan also announced a new all-time monthly record for passenger traffic at BWI Marshall Airport. With more than 2.5 million passengers, July 2017 was the busiest month in the history of the Airport, and the 25th straight monthly passenger record.
- LaunchPad provides opportunities for local startup and small business owners to jump start their retail program at BWI Marshall Airport. Launchpad, which supports local entrepreneurs and small business owners, offers extensive training and resources. Four LaunchPad businesses are now operating at BWI Marshall Airport.
- Flying Dog Tap House is now open at BWI Marshall Airport, the latest bar and restaurant from global restaurateur HMSHost at BWI Marshall Airport. Flying Dog Tap House offers a sensory immersion into the culture of the Flying Dog brewery as well as the taste of Maryland's food and beverage character.

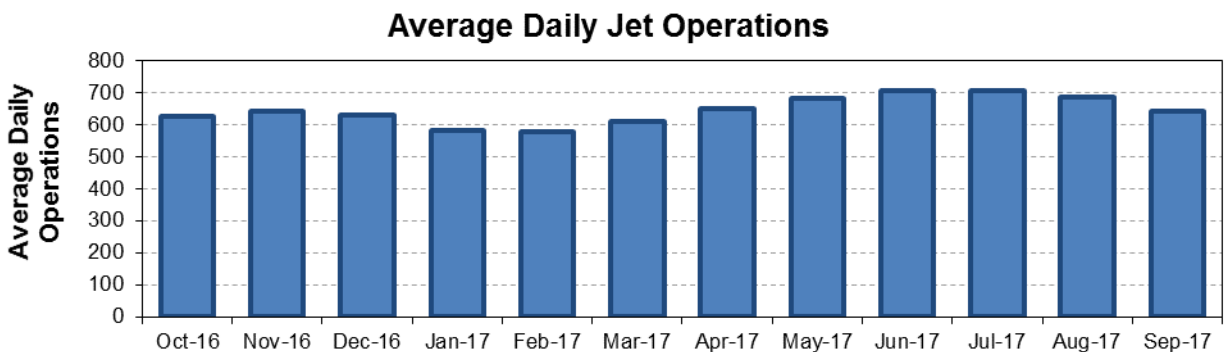
Airport Operations

This section presents information on the level of operational activity at BWI Marshall Airport, including air traffic levels by jet aircraft, runway use, and use of flight corridors.

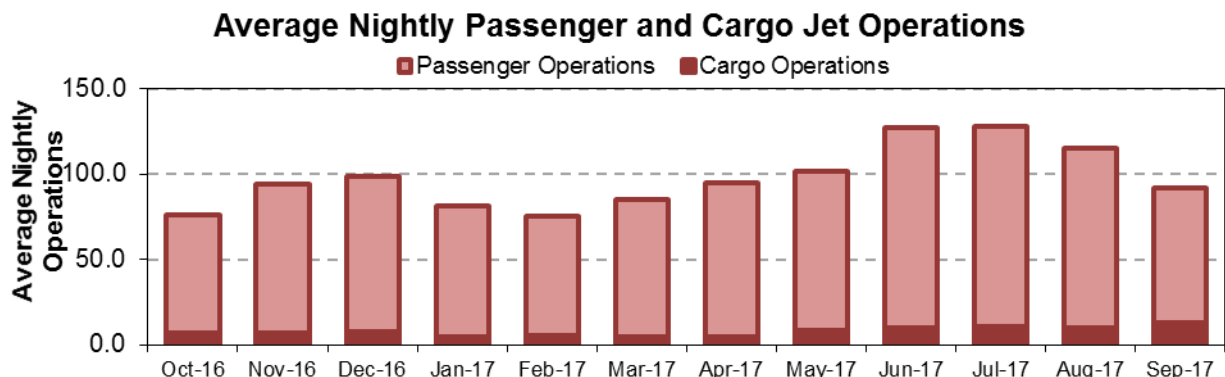
Overall Activity Levels and Nighttime Activity

The graph below presents the average number of daily jet flights at BWI Marshall Airport, including all arrivals and departures by business jets and air carrier aircraft by month. The figure also presents data for the preceding nine months, for a twelve-month total.

The average daily number of jet operations during the 3rd Quarter of 2017 was 677 as compared with 646 in the 3rd Quarter of 2016. Overall traffic levels were approximately 4.8% higher than the same period during 2016.



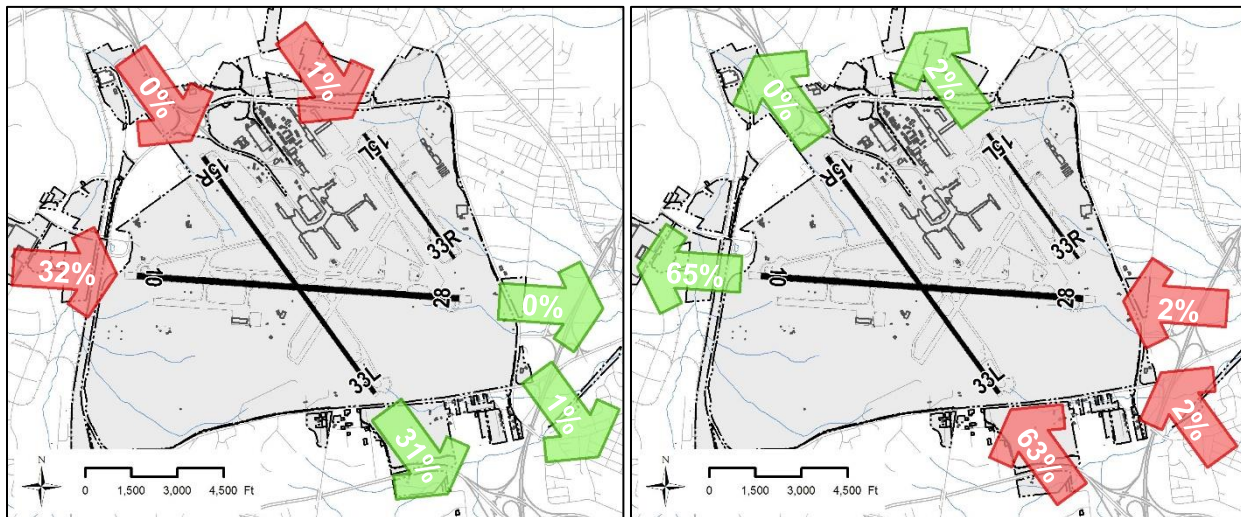
The following figure presents nighttime air carrier, business jets and cargo jet operations. At BWI Marshall Airport, a nighttime operation is defined as an arrival flight or departure flight that occurs between the hours of 10 pm and 7 am. The average number of nighttime jet operations was approximately 112 per night during the 3rd Quarter of 2017, compared to 98 per night during 3rd Quarter of 2016. The average number of nighttime cargo operations during the 3rd Quarters of 2016 and 2017 was approximately 7 and 11 per night, respectively.



Runway Use

The MDOT MAA maintains a preferential runway use program to minimize the aircraft noise impact on neighboring communities. For noise abatement purposes, west flow (aircraft departures to the west) is more desirable since a smaller population is impacted by aircraft noise when BWI Marshall operates in a west flow direction. Prevailing wind speed, direction and weather factors determine the direction of air traffic flow. Aircraft usually take off and land into the wind to meet safety and operational requirements.

The figures below show all jet¹ runway use for the 3rd Quarter of 2017. During east flow, all jet aircraft primarily depart (green arrows) from Runway 15R and arrive (red arrows) on Runway 10. During west flow, all jet aircraft primarily depart from Runway 28 and arrive on Runway 33L. Historical trends result in annual average west flow of about 70%.



All Jet East Flow Runway Use, 3rd Quarter of 2017 All Jet West Flow Runway Use, 3rd Quarter of 2017

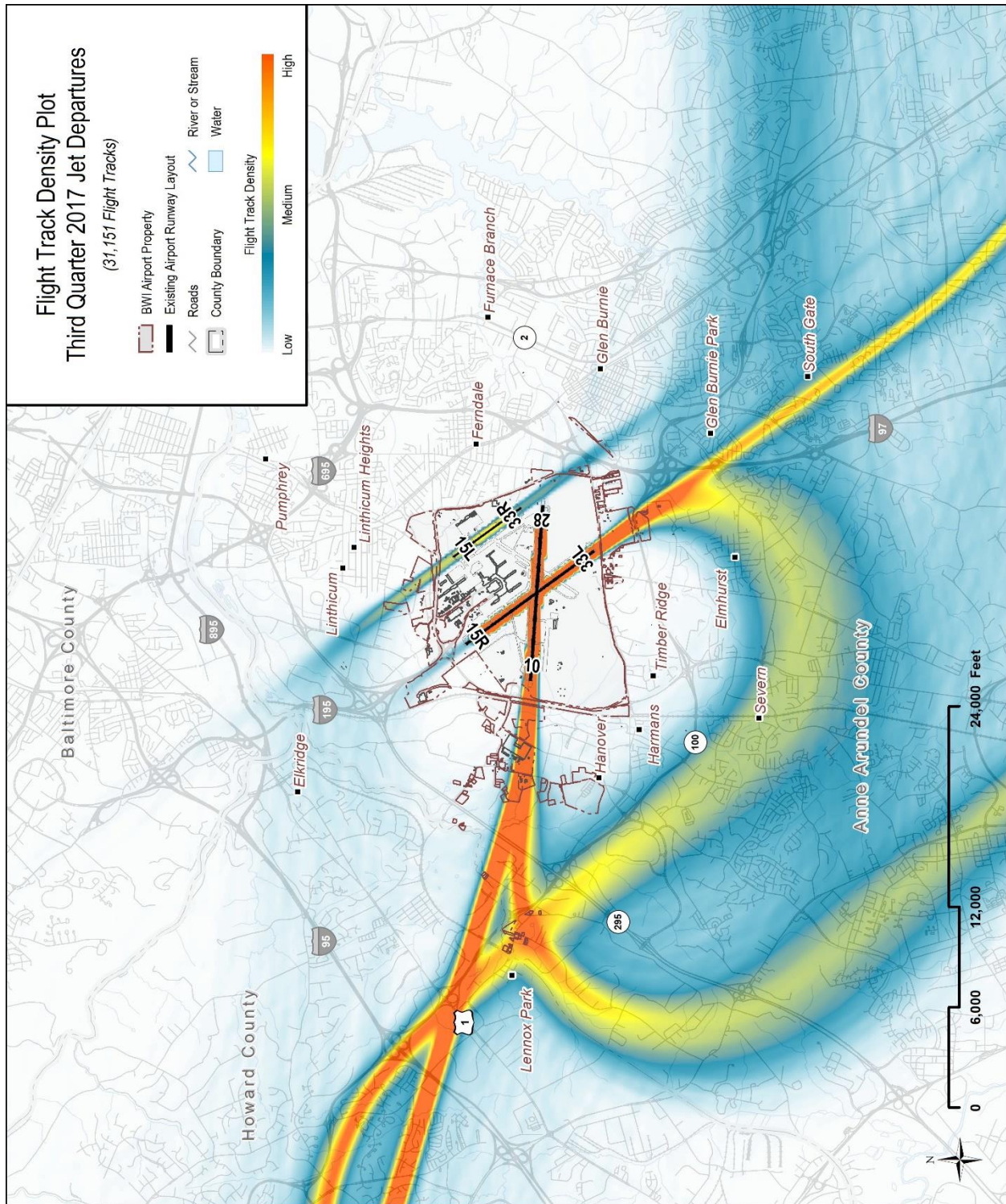
Flight Corridors

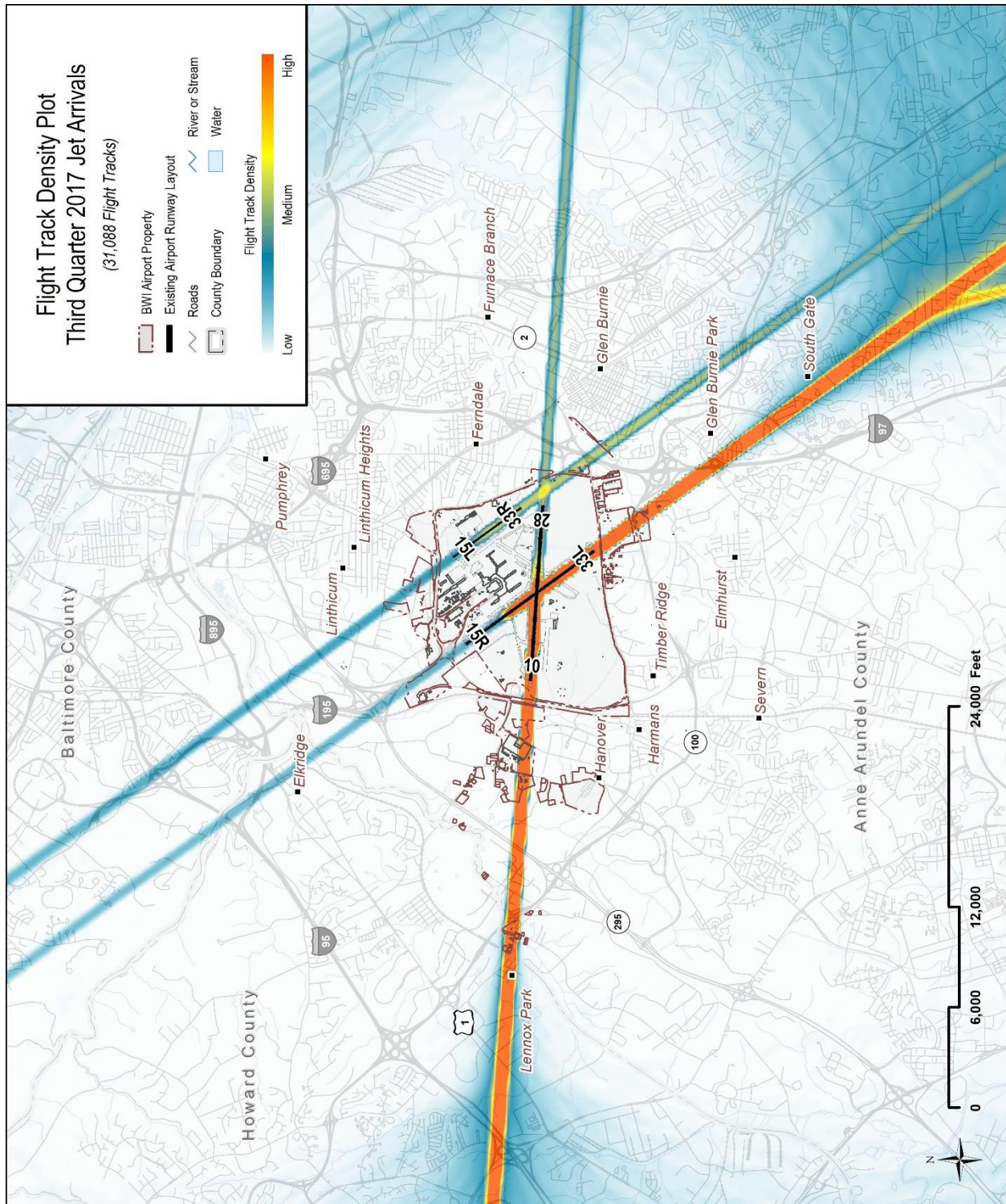
The following figures depict the flight corridors at BWI Marshall Airport for the following conditions and groups of aircraft as derived from BWI Marshall Airport's current noise and operations monitoring systems:

- All jet departures
- All jet arrivals

These "flight track density plots" use color gradations to depict the flight track geometry, dispersion, and relative frequency of overflights in areas of interest. The color ranges are assigned based on the relative density of aircraft operations during the 3rd Quarter of 2017.

¹ "All jet" includes commercial air carrier as well as private (corporate) jet aircraft.





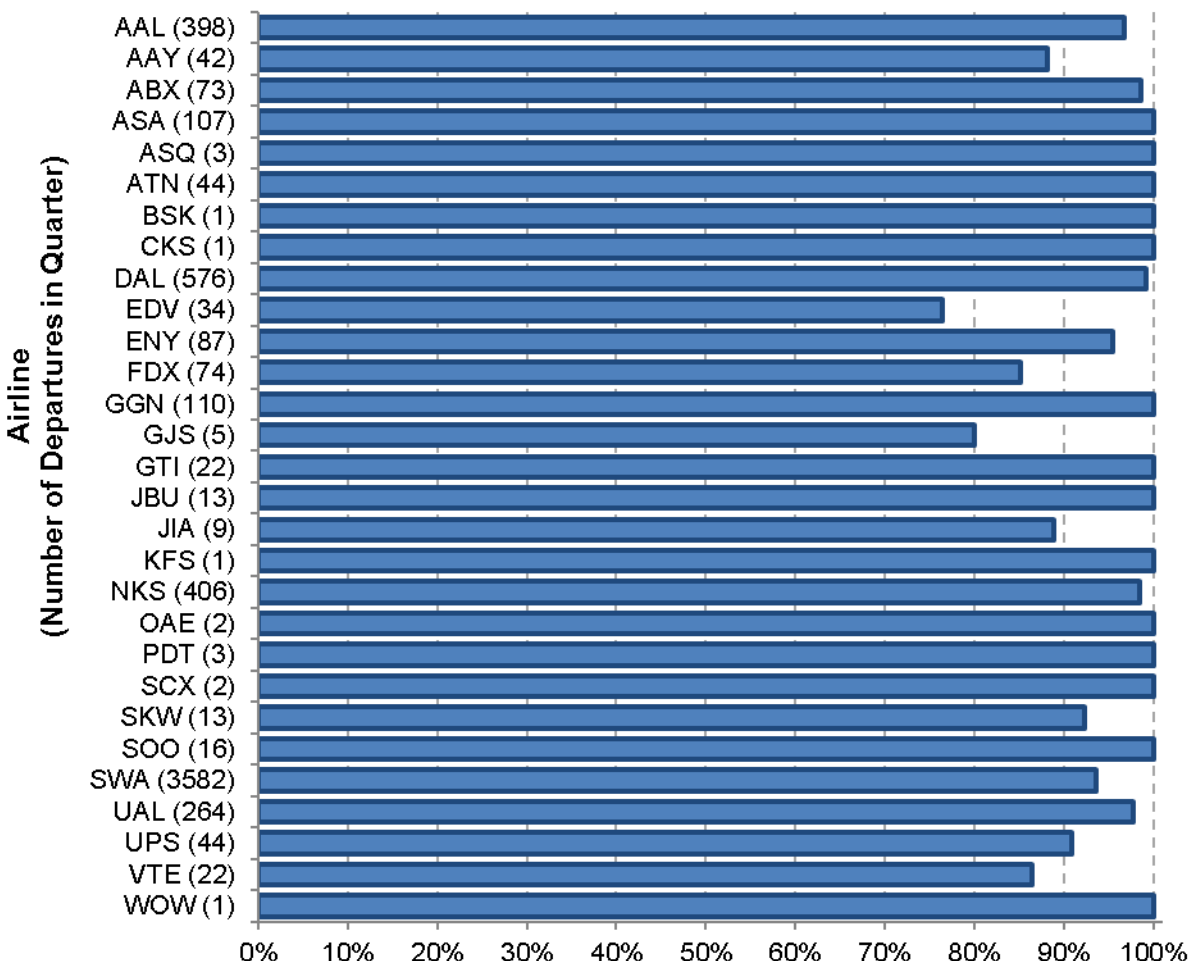
Observance of Noise Abatement Procedures

Using data obtained from BWI Marshall Airport's noise and flight track monitoring system, the table below shows how the major carriers and cargo operators perform on the the two noise abatement procedures of most interest to the local communities. These procedures are:

1. Runway 15 Right departures initiating their right turns at, but not prior to, 1 DME
2. Runway 28 departures initiating their turns at, but not prior to, 3 DME

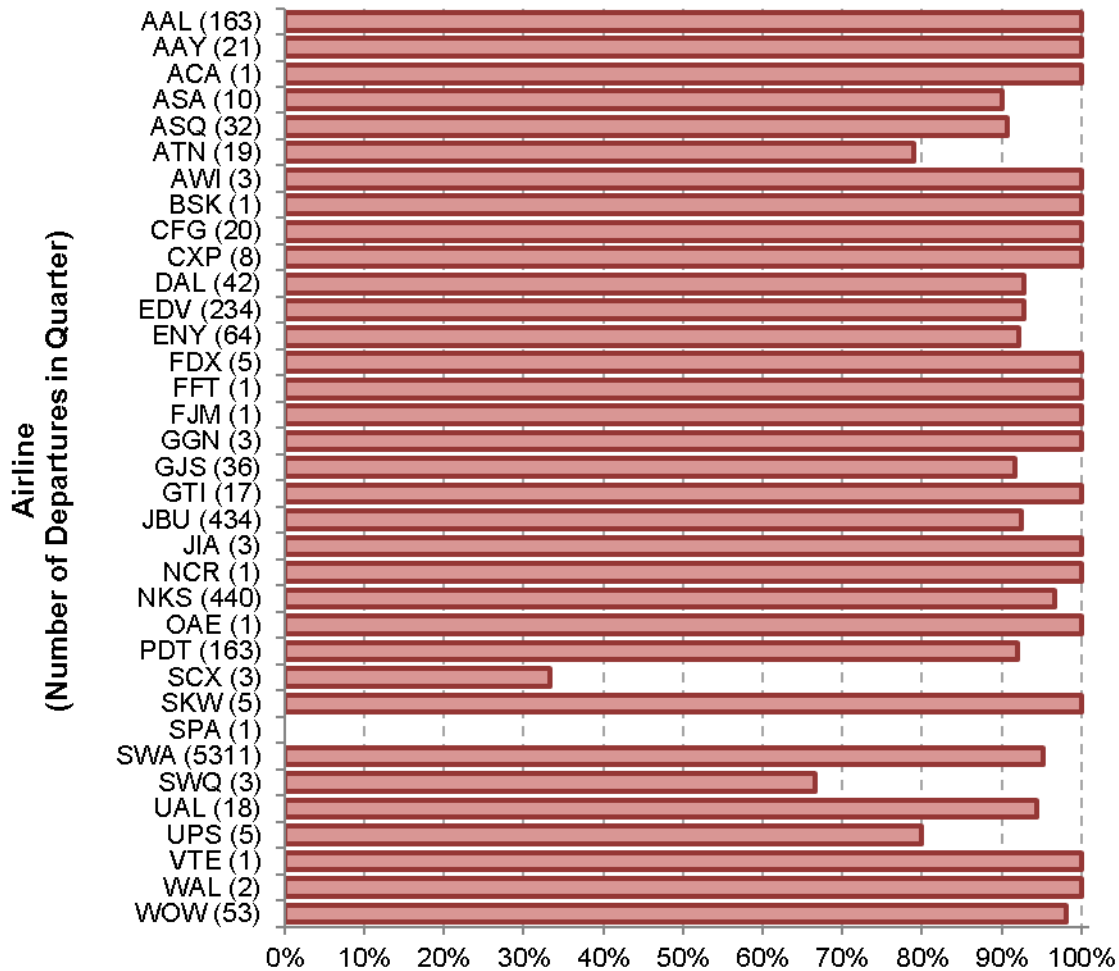
The following graphs show the percentage of flights for each airline which comply with each of the two procedures. DME stands for Distance Measuring Equipment, and is measured slant-range from the navigational aid located near the center of the Airport. One DME equals one nautical mile.

**Percentage of Runway 15R Departures
Turning Right Beyond 1 DME - Third Quarter 2017**



Third Quarter 2017

**Percentage of Runway 28 Departures
Turning Left Beyond 3 DME - Third Quarter 2017**



Outreach

The MDOT MAA engages in on-going efforts to enhance the level of communication and interaction between the Airport and area residents. The MAA Community Outreach Programs encourage the exchange of information between the MAA and local community groups and residences by providing a contact point for listening to and responding to Airport-related community concerns. These programs also supplement the efforts of the BWI Marshall Neighbors' Committee to promote the active participation of local residents in Airport issues.

The Division of Real Estate and Noise Abatement monitors services provided to the local community to promote public education, communication and the number of responses to requests for portable noise monitoring. Specific services or activities provided by the MAA and the Noise Abatement Office are listed below, along with the number of events or recorded reports.

Public Education & Activities –3rd Quarter of 2017

Committee Meetings	0
Community Meetings	1
Community Noise Monitoring Reports	8
Airport Zoning Permits	65
Mailings	0

Community Enhancement Grant Program

Maryland Senate Bill 276 established an 11-member "Citizens Committee for the Enhancement of Communities Surrounding Baltimore/Washington International Thurgood Marshall Airport." The intent of this legislation is to provide some benefit to those citizens living in communities impacted by the daily operation of BWI Marshall Airport by allowing them the opportunity to apply for grants for transportation-related projects such as sidewalks, speed humps, street lights, etc. These communities must be located within the 1998 certified Airport Noise Zone or within two miles of the outermost noise contour.

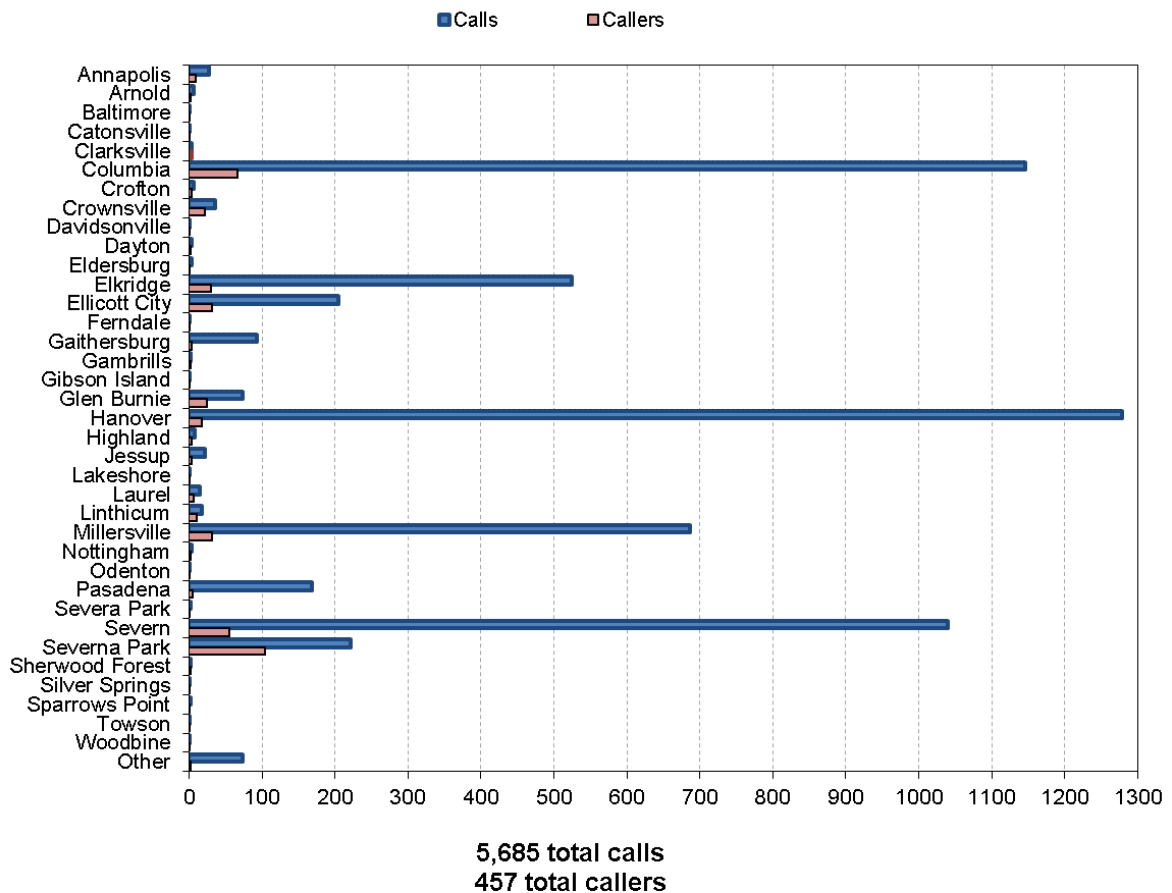
The Community Enhancement Grant Committee met on August 16, 2017. Four grant applications were submitted for review. The Committee recommended the approval of grant application #18-02, submitted by Olde Mill Condominium II, Inc., in the amount \$150,000.00 for removal and replacement of all sidewalks and monolithic curbs on Keith Court, Nathan Way, and Rebecca Ann Court located off Chalet Drive in Millersville, Maryland.

Airport Noise Hotline Calls

The MDOT MAA maintains a 24-hour Airport Noise Hotline at 410-859-7021. Staff is available during normal business hours to discuss aircraft noise concerns directly with callers. Voicemail is available for recording noise concerns at night and on weekends. Noise complaints can also be entered online at www.maacommunityrelations.com. The graph below shows the number of calls, e-mails and callers per community for the quarter. The map on the following page shows the locations and number of complaints for the 3rd Quarter of 2017.

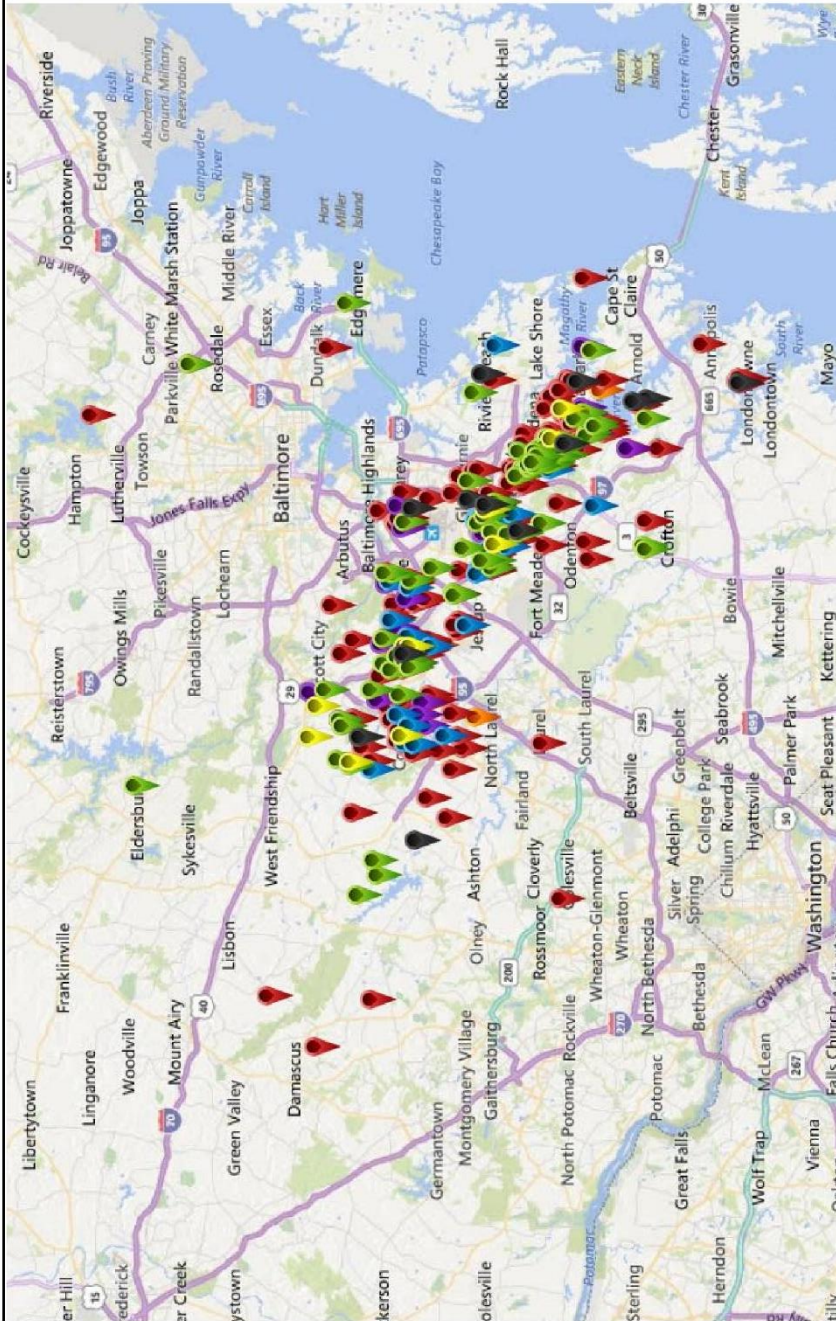
There were 5,685 complaints made by telephone or email, from 457 complainants during the 3rd Quarter of 2017 compared to 830 complaints from 251 complainants during the 3rd Quarter of 2016”.

Number of Noise Calls and Callers per Community



Run Time: 10/17/2017 08:50
Start Date: 07/01/2017 00:00
End Date: 09/30/2017 23:59

July 1, 2017 thru September 30, 2017



BWI Marshall Neighbors Committee

The BWI Marshall Neighbors Committee was established in December 1983 and serves as a liaison between the Airport and the surrounding communities to ensure continuing and timely discussion of mutual airport and community interests. The Committee serves as a forum for exchanging information, ideas and suggestions. Examples of interests include, but are not limited to:

1. Ground access (highways, light rail, etc.),
2. Long-range transportation planning issues,
3. Operational changes (construction, maintenance and air traffic control),
4. Noise abatement and other environmental issues,
5. Parking and ground transportation; and
6. Land use planning.

The BWI Marshall Neighbors Committee consists of the following groups:

- Columbia Council
- Greater Elkridge Community Association
- Elmhurst Improvement Association
- Glen Burnie Improvement Association
- Glen Burnie Park Civic Association
- Ferndale Area Community Council
- Greater Pasadena Council
- Harmans Civic Association
- Linthicum/Shipleigh Improvement Association
- Severn Improvement Association
- Timber Ridge Improvement Association

Airport Noise Zone

The Maryland Environmental Noise Act of 1974 provides for the protection of citizens from the impact of transportation related noise. The aviation portion of the Act requires the MAA to create a certified Airport Noise Zone (ANZ) to control incompatible land development around BWI Marshall Airport and a Noise Abatement Plan (NAP) to minimize the impact of aircraft noise on people living near the Airport. An ANZ and NAP were first established for BWI Marshall Airport in 1976. Both were updated in 1982, 1988, 1993, 1998, and 2007. The latest update to the ANZ became effective on December 22, 2014.

The ANZ is determined by a composite of three noise contours: a base year contour, a five-year forecast, and a ten-year forecast. The largest of the three contours in any area around the Airport determines the outline of the ANZ, thereby offering protection within the largest of the existing or future noise contours.

The contours depict the Day-Night Average Sound Level (DNL) around BWI Marshall Airport. Both the State of Maryland and the FAA require the use of the DNL metric by all airports conducting environmental studies. The current 2014 ANZ is depicted on the last page of this document.

Noise Monitoring Program

The Noise and Operations Monitoring System (NOMS) equipment in place at BWI Marshall Airport was installed in the late 1980's and early 1990's and is at the end of its useful life due to the age of the equipment and inability to obtain replacement parts. Additionally, five sites have been dismantled. The MDOT MAA is currently near completion of the procurement process for a new NOMS. The following tables present aircraft, community, and total noise levels at the permanent noise monitors for the third quarter of 2017 from the NOMS. A map of the noise monitoring locations is presented on the page following the tables.

The term DNL (symbolized as "L_{dn}" in mathematical equations) means Day-Night Average Sound Level, and is used to report aircraft, community and total noise levels. DNL is defined as the cumulative sound energy averaged over a twenty-four hour period, with ten-decibels (dB) added to noise events which occur between the hours of 10 p.m. and 7 a.m. This penalty accounts for the greater impact of noise events which occur at night. DNL is measured from midnight to midnight.

The first table shows the quarterly Aircraft (A), Community (C), and Total (T) DNL values at each site, where data is available. At some sites community or environmental noise levels (street traffic and other neighborhood noises) exceed aircraft noise levels. The second table shows the Aircraft (A) DNL by month. The tables also include the NOMS-reported percentage of time that each monitor was on within the respective time period.

2017 Quarterly Noise Measurements

RMS#	Location	Aircraft DNL (dBA)				Community DNL (dBA)				Total DNL (dBA)				Percent Time On			
		1QTR	2QTR	3QTR	4QTR	1QTR	2QTR	3QTR	4QTR	1QTR	2QTR	3QTR	4QTR	1QTR	2QTR	3QTR	4QTR
1	St. Augustine Church, Elkridge	43	45	46	-	60	63	68	-	60	63	68	-	98	96	92	-
2	Melrose Ave., Harwood Park	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Lennox Ave., Dorsey	62	64	65	-	60	60	61	-	64	66	66	-	100	98	98	-
4	Ridge Rd, Hanover	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Harmans Elementary School	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Delmont United Methodist Church	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Wicklow Woods, Ferndale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8*	Glen Burnie Heights	52	54	55	-	63	66	66	-	63	66	66	-	100	100	98	-
9	Army National Guard Armory	57	58	53	-	64	64	63	-	65	65	64	-	91	98	98	-
10	Pumping Station, Margate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Jones Rd., Queenstown	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Rippling Woods Elementary	62	63	64	-	59	65	63	-	64	67	67	-	100	100	98	-
13	Oakwood Park, Glen Burnie	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	Outer Approach End Rwy 15R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Inner Approach End Rwy 15R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	Stoney Run, Hanover	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	Timber Ridge Rd., Timber Ridge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	Approach End Rwy 15L	59	60	61	-	59	61	69	-	62	64	70	-	98	99	91	-
19	Hollins Ferry, Glen Burnie	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	Friendship Park, Glen Burnie	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	Glen Burnie Park Elementary	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	Columbia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	Quarterfield Elementary School	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

2017 Monthly Noise Measurements

RMS#	Location	Monthly Aircraft DNL and (Percent Time On)											
		Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	Jul 17	Aug 17	Sep 17	Oct 17	Nov 17	Dec 17
1	St. Augustine Church, Elkridge	43 (98)	43 (98)	43 (99)	45 (99)	46 (99)	43 (91)	44 (90)	45 (99)	47 (87)	-	-	-
2	Melrose Ave., Harwood Park	-	-	-	-	-	-	-	-	-	-	-	-
3	Lennox Ave., Dorsey	63 (100)	61 (100)	63 (100)	64 (100)	65 (100)	64 (93)	65 (100)	65 (100)	64 (95)	-	-	-
4	Ridge Rd, Hanover	-	-	-	-	-	-	-	-	-	-	-	-
5	Harmans Elementary School	-	-	-	-	-	-	-	-	-	-	-	-
6	Delmont United Methodist Church	-	-	-	-	-	-	-	-	-	-	-	-
7	Wicklow Woods, Ferndale	-	-	-	-	-	-	-	-	-	-	-	-
8*	Glen Burnie Heights	53 (100)	52 (100)	51 (100)	53 (100)	55 (100)	54 (100)	55 (100)	57 (100)	52 (95)	-	-	-
9	Army National Guard Armory	58 (94)	55 (95)	58 (84)	56 (94)	57 (100)	60 (100)	53 (100)	55 (100)	51 (95)	-	-	-
10	Pumping Station, Margate	-	-	-	-	-	-	-	-	-	-	-	-
11	Jones Rd., Queenstown	-	-	-	-	-	-	-	-	-	-	-	-
12	Rippling Woods Elementary	62 (100)	62 (100)	62 (100)	62 (100)	62 (100)	64 (100)	64 (100)	64 (100)	64 (95)	-	-	-
13	Oakwood Park, Glen Burnie	-	-	-	-	-	-	-	-	-	-	-	-
14	Outer Approach End Rwy 15R	-	-	-	-	-	-	-	-	-	-	-	-
15	Inner Approach End Rwy 15R	-	-	-	-	-	-	-	-	-	-	-	-
16	Stoney Run, Hanover	-	-	-	-	-	-	-	-	-	-	-	-
17	Timber Ridge Rd., Timber Ridge	-	-	-	-	-	-	-	-	-	-	-	-
18	Approach End Rwy 15L	58 (100)	59 (98)	58 (88)	59 (98)	59 (99)	61 (99)	60 (99)	61 (83)	61 (91)	-	-	-
19	Hollins Ferry, Glen Burnie	-	-	-	-	-	-	-	-	-	-	-	-
20	Friendship Park, Glen Burnie	-	-	-	-	-	-	-	-	-	-	-	-
21	Glen Burnie Park Elementary	-	-	-	-	-	-	-	-	-	-	-	-
22	Columbia	-	-	-	-	-	-	-	-	-	-	-	-
23	Quarterfield Elementary School	-	-	-	-	-	-	-	-	-	-	-	-

* Site 8: Due to tree growth near the monitor, the unit was not able to be calibrated during the most recent maintenance visit in 2017.

